

Observed Linkages between the Northern Annular Mode/North Atlantic Oscillation, Cloud Incidence, and Cloud Radiative Forcing

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1. Why decision support services?

The National Oceanic and Atmospheric Administration (NOAA) Next Generation Strategic Plan (2010)¹ identified four societal challenges that have been translated into NOAA long-term goals:

- Climate Adaptation and Mitigation – An informed society anticipates and responds to climate and its impacts.
- Weather-Ready Nation – Society is prepared for and responds to weather-related events.
- Healthy Oceans – Marine fisheries, habitats, and biodiversity are sustained within healthy and productive ecosystems.
- Resilient Coastal Communities and Economies – Coastal and Great Lakes communities are environmentally and economically sustainable.

Although climate is a cross-cutting theme in all four societal challenges, the first two most directly address developing NOAA climate information and products that are usable for decision support. For example, NOAA's National Weather Service (NWS) Strategic Plan (2011)² states a goal on enhancing climate service as a part of the Weather-Ready Nation goal. Becoming a Weather-Ready and Climate-Smart Nation implies building community resilience to extreme weather and long-term changes. The critical issue in achieving this goal is a need to move from serving products to serving decision support, i.e. to provide what people really need.

2. Climate-weather linkages

The centerpiece of decision support services includes advancing preparedness and planning for extreme weather and water events that can be achieved through understanding and effective use of information on weather-climate linkages. Climate variability and change often “drive” weather and water events. For example, El Niño/Southern Oscillation impacts temperature and precipitation in many parts of United States. Global climate change impacts the local climate with a recognizable seasonal and spatial variability (Livezey *et al.*, 2007). Understanding local climate drivers of weather and water events as well as ability to incorporate this information in weather forecasting process at local level are critical for developing decision support services.

3. Partnership

Developing background scientific methods for decision support service relies on NWS partnership with NOAA climate research offices, academia, and other partners in climate services such as state climatologists, who may represent either state university or state government institutions. NWS draws on the available scientific expertise and data for understanding climate variability and change impacts on local and regional weather and water elements. Delivery of decision support service depends on extensive network of partners

¹ NOAA Next Generation Strategic Plan 2010. <http://www.ppi.noaa.gov/ngsp/>

² NOAA's NWS Strategic Plan 2011. <http://www.nws.noaa.gov/sp/>

representing local government, emergency managers, natural resources oversight organizations and local communities.

4. Local Climate Analysis Tool (LCAT)

The new Local Climate Analysis Tool (LCAT, Figure 1), introduced in NWS operations in July 2013, highlights the effort to increase effectiveness of climate-related decision support service development and delivery. LCAT provides the most scientifically sound method and data for application in local climate studies. LCAT allows a user to answer questions like: Is the local temperature changing in my town, and how fast does the change occur? What is the relationship between El Niño/Southern Oscillation and precipitation in my town? Does the behavior of drought spell change over time? LCAT is linked from the NOAA climate portal (<http://www.climate.gov>) or directly at <http://nws.weather.gov/lcat/>. LCAT can be used for environmental applications, community planning, event preparedness, and natural resource management decisions.



Fig. 1 Functions and features of Local Climate Analysis Tool.

5. Second generation of NWS version of Automated Climate Information System (xmACIS)

The second generation of NWS version of Automated Climate Information System (xmACIS2) has been released in May 2013. The xmACIS2 interface provides near real-time mining of climate data records from the NWS weather observation system, as archived by NOAA National Climate Data Center, and is enhanced with data mining capabilities by the Northeast Regional Climate Center. Compared to the previous version, xmACIS2 includes additional features for multiple station data mining, a larger suite of climate statistics, and new data selection and reporting options. NOAA internal users can access xmACIS2 at <http://xmaccis.rcc-acis.org/>. The public can access xmACIS data information either by using NOAA Online Weather Data (NOWData, Figure 2) at <http://www.nws.noaa.gov> or by contacting a climate focal point in their local NWS Weather Forecast Office.

6. User support

To enhance climate information application, the NWS tools are enhanced with training modules, consisting of help documentation and dynamic interpretation statements. For example, the LCAT Learn section consists of eleven online audio-visual tutorials covering an introduction to LCAT, background of LCAT data, scientific methodologies recommended for local climate studies, and LCAT applications in NWS climate services operations including decision support service. By developing support features for operational NWS uses, with explanations of the scientific background and best practices for methodology in local climate studies, LCAT enhances our ability to create linkages to climate information in decision support services.

National Weather Service Climate - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.weather.gov/climate/xmacis.php?wfo=riw

weather.gov

National Weather Service Forecast Office

Western and Central Wyoming

Home News Organization Search for: ☐ NWS ☐ All NOAA Go

Local forecast by "City, St" Go

Current Hazards
 Watches/Warnings
 Outlooks
 U.S. Hazards
 Hurricane Info
 Safety Rules
 Reports
 eSpotter

Current Conditions
 Observations
 Satellite Images
 Rivers & Lakes
 AHPS
 Road & Travel

Radar Imagery
 Local Radar
 Nationwide
 Experimental RIW
 Ridge Radar

Forecasts
 Local Area
 Aviation

Observed Weather Climate Locations Climate Prediction Climate Resources Local Data/Records Astronomical NOWData

NOWData - NOAA Online Weather Data

1. Product »
☐ Daily data for a month
☐ Daily almanac
☐ Monthly avgs/totals
☐ Monthly occurrences
☐ Monthly extremes
☐ Daily extremes
☐ Daily/monthly normals
☒ Record extremes
☐ First/last dates

2. Location »
 Casper Area
 Lander Area
 Afton, WY
 Bondurant, WY
 Boulder Rearing, WY
 Boysen Dam, WY
 Clark 3 Ne, WY
 Cody, WY
 Cora, WY
 Dubois, WY

3. Variable »
☐ Max Temperature
☒ Min Temperature
☐ Avg Temperature
☐ Precipitation
☐ Snowfall
☐ Snow Depth
☐ Heating Degree Days
☐ Cooling Degree Days
☐ Growing Degree Days

4. Month »
 Entire Year
 January
 February
 March
 April

5. High/Low »
☒ Highest
☐ Lowest

6. View »
 Go

Product Description:
 RECORD EXTREMES - finds the top ten extreme values (highest or lowest) for any day during the station's period of record. Searches can be restricted to a month or season, if desired. Spring=Mar-May; Summer=Jun-Aug; Fall=Sep-Nov; Winter=Dec-Feb. Additional stations are available from the Regional Climate Centers and the National Climatic Data Center.

- NCDC Map Services -
 - Common questions -
 - Submit a question/comment -

Powered by **ACIS**
 NOAA Regional Climate Centers

Fig. 2 NOWData features

References

- Livezey, R.E., K.Y. Vinnikov, M.M. Timofeyeva, R. Tinker, and H.M. van den Dool, 2007. Estimation and Extrapolation of Climate Normals and Climatic Trends. *Journal of Applied Meteorology and Climatology*, Vol 46, pp. 1759-1776.